The Role of Tea Polyphenols in LDL Oxidation

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Tea is the most popularly consumed beverage worldwide, also was popular in Indonesia. There are three main types of tea: black tea, green tea and Oolong tea. Oolong tea is produced by a partial oxidation of the leaf, intermediate between the process for green and black tea. Most of people in the world consume Black tea.

The possible beneficial health effects of tea are being investigated and have received a great deal of attention. Some study concludes that green tea has more health benefits than an equal volume of black tea in terms of antioxidant capacity. The possible beneficial health effects of tea consumption have been suggested by epidemiologic studies and supported by several laboratory studies. Rich in polyphenols including catechin, flavone, flavonol, theaflavin, anthocyanidin, thearubigin and miniphenol formaldehyde, tea polyphenols act as antioxidants. Therefore, tea polyphenols have been proposed to have some benefits such as anti-cancer, reducing plasma lipids, protecting cardiac and cerebral vessels. The Boston Area Health Study found that subjects who drank one or more cups of black tea every day had approximately half the risk of a heart attack compared with those who did not drink tea at all. Other studies, however, are not consistent with such beneficial effects. Hof et al found that tea polyphenols accumulated in low density lipoprotein (LDL) particles after 3 days of green or black tea consumption, but their levels were not sufficient to enhance resistance to LDL oxidation.

One of the proposed mechanisms for the possible protective effect of tea against cardiovascular diseases is that tea polyphenols inhibit the oxidation of LDL, which is known to be involved in the development of atherosclerosis. Tea polyphenols prevent oxidative stress, protect LDL from oxidation and, in parallel, reduce the development of atherosclerotic lesions.

A recent study by Wahyudi and Sargowo conclude that green tea polyphenols has the ability to inhibit NF-KB activation and TNF-α production. In this in vitro study using HUVECS which isolated from fresh umbilical cord obtained at normal deliveries, they found that there was increasing level of NF-KB activation and TNF-α expression in pretreatment with green tea compared to control. Pretreatment of green tea polyphenols reduced oxLDL-induced production of proinflammatory cytokine TNF-α and NF-KB suggest that green tea polyphenols may be effective therapy for prevention of endothelial.

As tea is already one of the most popular beverages worldwide and in some studies the beneficial effects are not consistent, we need studies designed to assess tea consumption and tea polyphenol status. Those studies should be directed to quantifying its role in the primary and secondary prevention of atherosclerotic diseases.

REFERENCES